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**Reliability and Validity of the Attitudes to Ageing  
Questionnaire (AAQ) in older people in Spain**

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Reliability and Validity of the Attitudes to Ageing Questionnaire (AAQ) in older people in Spain.

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**Running title:** Reliability and validity of the AAQ in Spanish elderly.

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Title: Reliability and Validity of the Attitudes to Ageing Questionnaire (AAQ) in older people in Spain.

**Background:** As ageing is a personal experience, an attitude to ageing questionnaire is essential for capturing the most realistic appraisal of this important life stage. Our aim was to study the psychometric properties of the Attitudes to Ageing Questionnaire (AAQ) in a sample of Spanish older people.

**Methods:** Two hundred forty two participants aged 60 years and older were recruited from community centres, primary care centres, and family associations for the mentally ill and dementia. In addition to the AAQ, participants provided information on demographics, self-perception of health, comorbidity, health status (SF-12), depressive symptoms (GDS-30), and quality of life (WHOQOL-BREF and WHOQOL-OLD). Analysis was performed using standard psychometric techniques with SPSS v15.0.

**Results:** no floor and ceiling effects were found, and missing data was low. The internal consistency measured by Cronbach's alpha for AAQ subscales were .59, .70 and .73. Exploratory Factor Analysis produced a three factors solution accounting for 34% of the variance. A priori expected associations were found between some AAQ subscales with WHOQOL-BREF domains, WHOQOL-OLD, SF-12 and the GDS-30, indicating good construct validity. In general, AAQ subscales differentiated between participants with lower and higher levels of education, and between a priori defined groups of older people (nondepressed vs. depressed; those with higher vs. lower physical comorbidities and non-carers vs. carers).

**Conclusions:** The Spanish version of the AAQ questionnaire showed acceptable psychometric properties in a convenience sample of Spanish older people. It is a useful measure of attitude for use with older people in social and clinical services.

**Keywords:** Attitudes to Ageing Questionnaire, AAQ, elderly, reliability, validity

Introduction

Profound demographic change affecting the age distribution of societies is a global phenomenon, with the population ageing we are witnessing today unprecedented in the whole of human history (UN, 2009). Commonly, in Western Societies the social stereotype of ageing is a negative one (Levy, 2009) and Spain is not an exception to this. Surprisingly, when older people are asked about ageing, their experience of ageing is often seen in a more positive light, in which growth, development, and positive change are still possible and commonplace (Laidlaw *et al.*, 2007; Vaillant, 2002). The majority of older people experience ageing as just another stage of life where loss and change is a universal experience accepted as part of a longer lifespan (Boerner and Jopp, 2007). Consistent with this is the phenomenon of the ageing paradox, where older people typically report high levels of life satisfaction at the stage of life most associated with cognitive and physical decline (Carstensen and Lockerhoff, 2003). Recent research suggests older people do not necessarily, nor universally experience ageing as a negative event in life as longitudinal data demonstrates many older people experience ageing as a relatively benign experience with the result that they develop enhanced well-being and greater emotional stability across the lifespan (Carstensen *et al.*, 2011).

Ageing is a process rather than a state and is a uniquely personal experience so that an individual's attitude towards the ageing process may affect the quality of later years as well as long-term health related outcomes (Levy *et al.*, 2002; Harrison *et al.*, 2008), including mortality (Levy and Myers, 2005). Social support may act as a buffer between stressful situations and mental health outcomes (Cohen and Wills, 1985), and physical health outcomes and functional limitations (Harrison *et al.*, 2008; Fong *et al.*, 2006). In addition, perceptions of ageing may be influenced also by how fast function declines (Harrison *et al.*, 2008). Nevertheless, studies of how social support might impact attitudes toward ageing are scarce (Harrison *et al.*, 2008). As such when trying to understand the experience of ageing, older people are the only section of society qualified to comment on this. Thus older people have the most intimate knowledge of adaptation to the ageing process, and therefore an attitudes to ageing questionnaire that can capture personal experiences of ageing in the context of more general attributes about attitudes to ageing is an important assessment tool (Laidlaw *et al.*, 2007).

Until now, with the development of the Attitudes to Ageing Questionnaire (AAQ) (Laidlaw *et al.*, 2007) there have been very few measures that explicitly assess the individual experience of ageing in a more contemporary and broad manner. Prior to the development of the AAQ researchers commonly used a subscale of the Philadelphia Geriatric Morale Scale (PGCMS) (Lawton, 1975) to index attitudes to ageing. The PGCMS was designed to provide a measure of morale or psychological well-being in social studies on the field of gerontology. The PGCMS subscale, attitude toward own ageing consists of five items that capture a very restricted snapshot of the experience of ageing. While it has been used in a variety of gerontological studies in a number of countries, including Spain (Stock *et al.*, 1994), it is nevertheless inadequate as a general tool to flexibly and comprehensively measure attitudes to ageing (Laidlaw *et al.*, 2007).

The AAQ has been developed using the methodology for scale development collated by the World Health Organisation Quality of Life Group (The WHOQOL Group, 1998a, b) in the context of the development of an adaptation of the WHOQOL measures for use with older adults (Power *et al.*, 2005). It was based on an intense theoretical debate among international experts, as well as in focus groups carried out with older adults to confirm or adjust the instrument items. Barcelona was one of the centers used in the original focus groups for development of the AAQ.

The AAQ assesses the subjective perception of ageing focussing primarily on three different aspects of ageing. The first subscale focuses on psychosocial losses relevant to older adults in which the perceived negative experiences of ageing are collected together in a single composite scale. This subscale functions as a proxy for negative attitudes to ageing where old age is seen primarily as a negative experience involving psychological and social loss. The second subscale (physical change) has a more mixed physical functioning focus with items related primarily to health, exercise and the experience of ageing itself. The third subscale (psychological growth) has an explicitly positive focus and could be summarised as 'Wisdom' or 'Growth' as it recognises a lifespan development perspective on ageing as viewed by the individual. Thus, the three domain structure of the AAQ reflects both positive and negative aspects of ageing. The subjective perspective of ageing is important in the AAQ, as it allows researchers a way of measuring attitudes toward ageing from the perspective of the older people themselves as this provides researchers with a unique insight into the experience of ageing (Chachamovich *et al.*, 2008). The AAQ utilises two different

answer formats in order to provide an experimental and general approach to understanding an individual's attitudes. Thus section one comprises of personal experiential questions such as 'growing older has been easier than I thought' and section two comprises of more general attitudes such as 'wisdom comes with age'. This feature adds to the potential usefulness of this tool as it was designed to be used by researchers, clinicians and policy makers (Laidlaw *et al.*, 2007).

The AAQ demonstrates good psychometric performance, acceptable Cronbach's alpha coefficients, good test-retest reliability, discriminant validity and concurrent validity (Laidlaw *et al.*, 2007). Our objective was to assess the reliability and validity of the Spanish version of the AAQ.

**Methods**

**Participants**

A convenience sample of 242 Spanish older people was recruited from community centres, primary care centres and family associations (including caregivers of patients with severe mental disorders, as schizophrenia, and caregivers of patients with dementia). One of the authors (RLC) contacted centres, provided information to staff and explained the purpose of the study. At each site, a staff member (primary care physician, social worker) invited participants to take part in the study and obtained written informed consent. Participants were included if they were at least 60 years of age and able to read and write. Persons with severe visual or hearing impairment, memory problems or cognitive impairment were excluded. Participants completed measures at each participating centre. All information was self-reported. This study was part of a larger Project, the WHOQOL-OLD which aimed to develop a cross-cultural specific module to appraise QoL in older people in order to supplement the existing WHOQOL questionnaire (The WHOQOL Group, 1998a, b). The project was financed by the European Commission Fifth Framework Programme (QLRT-2000-00320) (Power *et al.*, 2005).

**Procedures and measures**

*Attitudes to Ageing Questionnaire (AAQ)*

The AAQ assesses the subjective perception of ageing; it contains three subscales (psychological growth, physical change, and psychosocial loss) of eight items each (Table 1). Each item is scored on a five-point scale, with scores ranging from 8 to 40. The total scores on the physical change and psychological growth domain of the AAQ are summated to give an indication of the attitudes to ageing with higher scores indicating a more positive appraisal of ageing. Total scores on the psychosocial loss domain can be summated to give an indication of the attitudes to ageing with higher scores (stronger endorsement of items in this domain) indicating a more negative appraisal of ageing (Laidlaw *et al.*, 2007).

INSERT TABLE 1 ABOUT HERE

#### *World Health Organization Quality of Life (WHOQOL) -BREF*

The WHOQOL-BREF is a generic QoL questionnaire comprising 26-items; 24-items covering four domains (physical, psychological, social relationships and environment) and two global questions about Overall QoL and Satisfaction with Health. The items have a 5-point Likert response scale; scores range from 4 to 20, with higher scores representing higher QoL; and a time base relating to the previous two weeks (The WHOQOL Group, 1998b).

#### *WHOQOL-OLD*

The WHOQOL-OLD is a QoL module specific for older people that can be used in addition to the generic WHOQOL-BREF. It consists of 24 items rated on a five-point Likert response scale covering six facets: sensory abilities; autonomy; past, present and future activities; social participation; death and dying; and intimacy. Scores range from 4 to 20, with higher scores representing higher QoL. The time frame for assessment is the past 2 weeks (Power *et al.*, 2005). The Spanish version was used (Lucas-Carrasco *et al.*, 2011).

#### *Short Form Health Survey (SF-12)*

It is a measure of health status developed for the Medical Outcomes Study (MOS) containing 12 items summarized as two scores: physical (PCS-12) and mental (MCS-12). Time reference for assessment is the preceding four weeks (Ware *et al.*, 2002).

#### *Geriatric Depression Scale (GDS-30)*



The GDS is a 30-item self-reported questionnaire that measures depressive symptoms in older people with answers reported on a simple yes/no format. The time frame for the measure is the past week. High scores indicating more severe depression with a cut-off score of 10-19 indicating mild depression and 20-30 indicating severe depression (Yesavage *et al.*, 1983).

In addition, sociodemographic information was obtained using a semi-structured interview format developed for use in all the centers (for details see Laidlaw *et al.*, 2007) that recruited participants into the development study for the AAQ.

**Analysis**

Acceptability, reliability and validity were assessed using standard psychometric methods. To assess acceptability, we examined floor and ceiling effects and missing data for summary scores. Floor and ceiling effects were present if high percentages of respondents achieved the lowest or highest possible score (Streiner and Norman, 1995). Internal consistency reliability was assessed using Cronbach’s alpha ( $\geq .70$ ) (Cohen, 1988). We used exploratory factor analysis to examine the factor structure and verify support for scales from the original measure. The Kaiser-Meyer-Olkin statistic (KMO) and the Bartlett test of sphericity were used to test if there was underlying structure to the data;  $KMO > .5$  was required as well as a significant Bartlett test. We used principal components as the extraction method and used factor loadings  $\geq .40$  as a criterion to define a “salient” factor loading (Nunnally and Bernstein, 1994). A Varimax rotation procedure was applied to place items with their appropriate factor.

To assess convergent validity, we examined the association of the AAQ with age, the WHOQOL-BREF domains, WHOQOL-OLD, SF-12 components and GDS-30. Pearson correlation analyses were performed to explore related factors, we considered a correlation of  $< .3$  to be small,  $.3 - .5$  moderate and  $\geq .5$  large (Cohen, 1988). A  $p$  value  $< .05$  was regarded as statistically significant.

To assess discriminant validity, we examined the association of the AAQ subscales with sociodemographic variables: gender and education (primary school and lower vs. higher than primary school). Finally, to assess “contrasting” group differences, we compared

AAQ for subgroups of participants defined on the basis of significant depressive symptoms measured with GDS-30 (GDS-30 < 11 vs. GDS-30  $\geq$  11), number of self-reported chronic health conditions (< 4 vs.  $\geq$  4) and groups of participants (from primary care and community centres vs. caregivers). Based on previous research we did not expect to find associations with sociodemographic variables. We expected nondepressed, participants with a lower number of chronic health conditions (i.e. < 4), those from primary care and community centres to score higher on the AAQ psychological growth and physical change subscales and lower on the psychosocial loss subscale. Thus, we expected healthy non-depressed participants to endorse more positive attitudes to ageing compared to depressed participants, or those with higher number of chronic health conditions, or those who are caregivers. T-tests were performed to examine group differences with a two-tailed p-value <.05 regarded as statistically significant. All statistical calculations were performed with SPSS for Windows v19.0 (SPSS v19.0 for Windows; SPSS, Inc., Chicago, IL).

## Results

### Sample characteristics

Nearly seventy percent of participants were from primary care centres and community centres; the remaining 29.8 percent were caregivers. Table 2 shows participant characteristics.

INSERT TABLE 2 ABOUT HERE

### Psychometric properties of the AAQ

*Acceptability.* There were no floor/ceiling effects. Percentage of missing information was low.

*Reliability.* Internal consistency measured by Cronbach's alpha was .59 for Psychological Growth, .73 for Physical change and .70 for Psychosocial Loss (Table 3).

INSERT TABLE 3 ABOUT HERE

*Factor Structure.* The Kaiser-Meyer-Olkin statistic (KMO) was greater than .5 (KMO=.703) and the Bartlett test of sphericity was significant ( $p < .05$ ), indicating an underlying structure in the scale. Table 4 presents the factor solution for the Spanish

version of AAQ. After principal components factor extraction and Varimax rotation, the solution indicated a model with three factors that accounted for 34% of the variance. Visual inspection of the Scree Plot also strongly supported the three factors solution. Results using principal axis factoring were basically unchanged. All items, except two items (*Important to take exercise at any age* and *Want to give a good example*), loaded  $\geq .40$  on any factor, one item (*Growing older easier than I thought*) loaded  $\geq .40$  on two factors, and one item (*Believe my life has made a difference*) loaded on another factor.

INSERT TABLE 4 ABOUT HERE

*Convergent validity.* A statistically significant negative correlation was found between AAQ Physical change and age ( $r = -.137, p = .046$ ). As expected, moderate correlations were found between AAQ physical change and psychosocial loss subscales with the physical and psychological WHOQOL-BREF domains; the WHOQOL-OLD; the total GDS and the PCS-12 (Table 5).

INSERT TABLE 5 ABOUT HERE

*Discriminant validity* showed that men scored significantly higher on the psychosocial loss subscale compared to females [ $t(219) = 2.229, p = .027$ , two tailed]. Participants with higher educational level scored significantly higher on the physical change [ $t(211) = -2.138, p = .034$  two tailed] and lower on the psychosocial loss subscales [ $t(217) = 2.641, p = .009$  two tailed] (Table 6).

*A priori defined groups.* Participants with lower depressive symptoms ( $GDS-30 < 11$ ) compared to those with higher symptoms ( $GDS-30 \geq 11$ ) scored significantly higher on the physical change and lower on the psychosocial loss subscales. A similar result was found between participants self-reporting lower number of chronic conditions ( $< 4$ ) compared to participants reporting greater number of chronic conditions ( $\geq 4$ ). Compared to caregivers, participants from primary care and community centres scored significantly higher on the physical change and psychological growth subscales (Table 6).

INSERT TABLE 6 HERE

## Discussion

Our aim was to study the psychometric properties of the Spanish version of the AAQ among Spanish elderly. The Spanish version of the AAQ showed satisfactory psychometric properties (acceptability, internal consistency, and construct, convergent and discriminant validity). The AAQ was designed to assess attitudes towards ageing across cultures. All subscales had lower reliabilities than those reported in the international study (Laidlaw *et al.*, 2007) where each domain reported very similar PSI scores (the IRT equivalent of Cronbach alphas). In the current study the Psychological growth subscale demonstrates the lowest reliability. Deleting the item *Believe my life has made a difference* increases reliability to .62, though this remains lower than acceptable level. This apparent breakdown in reliability is difficult to explain given that the larger original data sample (Laidlaw *et al.*, 2007) reports no problems with reliability. It is possible that some of the conceptual ideas contained in the psychological growth domain may be more sensitive to the difference in the participant sample recruited here. Thus in the current sample here there is more variability because of the mix of caregivers and non-caregivers. As a consequence we have inherited a larger degree of heterogeneity in our sample in terms of an individual attribution towards the experience of ageing. For example, becoming a dementia caregiver is a major life event involving both negative (Pinquart and Sorensen, 2011) and positive aspects (Cohen *et al.*, 2002) and it is highly likely the reduction in reliability on the AAQ domain of Psychological Growth is a consequence of this. Given the challenges and variability in providing caregiving, items like wisdom accruing and becoming more accepting of oneself may become polarized between caregiving and non-caregiving. Two recommendations flow from this issue. First, in future research participants should be more homogenous in terms of current life experiences, and second, a study exploring the impact of caregiving on attitudes to ageing is urgently recommended.

Three factors emerged that correspond to the identical factor structure as found in the international study. The three-factors solution were psychosocial loss, physical change and psychological growth/ wisdom. All items, except two items loaded  $\geq .40$  on any factor, though these two items loaded more than .35.

In terms of discriminant validity, regarding associations between the AAQ and sociodemographic variables, level of education showed significant differences in two

AAQ subscales and gender in one subscale. In this current study, participants with more chronic medical conditions, significant depressive symptoms, and caregivers also had more negative attitudes toward ageing (lower AAQ scores). These findings are consistent with previous reports about negative images of poor physical health and its association with negative attitudes toward ageing (Harrison *et al.*, 2008; Bryant *et al.*, 2012), which in turn has detrimental effects on future health outcomes (Levy *et al.*, 2002). Social support may act as a buffer between stressful situations and physical and mental health outcomes in the case of caregivers (O'Connor and McCabe, 2011).

In Spain, a recent survey indicated that caregivers of older people are mostly female (82.6%), and nearly one third are 60 years and older. However, health and social care services are limited to satisfy adequately their needs. Additionally, Spanish caregivers of persons with dementia (mostly spouses, daughters) talking about their experiences of caregiving reported not being listened to by their primary care physicians when noticing early stage symptoms of dementia such as forgetfulness, irritability, confusion, disorientation or lack of initiative (Lucas & Monteserín, 2007). These early symptoms of dementia may be dismissed as 'normal' experiences of ageing. This may suggest that healthcare providers endorse a negative attitude to ageing that may result in people not experiencing help at a time when it is needed. Perhaps as the AAQ research enterprise develops, attitudes of healthcare providers may become the subject of scrutiny.

In a recent study looking at QoL in caregivers providing care to recipients with four different illnesses, mood proved to be a significant predictor for QoL (O'Connor and McCabe, 2011). Likewise in this current study, mood is hypothesised to have an important impact on AAQ scores. Levy (2003) states that ageist attitudes internalized during childhood become negative age-stereotypes that are reinforced by an attentional bias to negative information about ageing and eventually these beliefs become negative self-stereotypes. Thus as individuals age, internalised age stereotypes operating outside the individual's conscious awareness, become activated by congruent negative experiences attributed to ageing (the stress is only relevant as it is congruent with the diathesis).

Older people may be prone to attribute negative events in later life as a consequence of ageing resulting in an enhanced psychological vulnerability in later life for those who endorse negative beliefs about age (Levy, 2009). In other words negative

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3 events are attributed to the ageing process and this plausible explanatory construct  
4 reinforces an individual's negative appraisals congruent with a negative self-stereotype  
5 of ageing so that the older person misattribute symptoms of depression (sleep  
6 disturbance, anhedonia, hopelessness about the future, etc) as being merely the negative  
7 consequences of ageing and thus fails to seek help for a treatable illness. Consistent  
8 with this idea is evidence that depressed older people who attribute depression to ageing  
9 are less likely to seek treatment for it (Sarkisian *et al.*, 2003).  
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16 Improving mood results in an improvement in attitudes to ageing (Chachamovich *et al.*,  
17 2008). Therefore, the difficulty may be that others (social and healthcare professionals  
18 inexperienced in working with older people) may also unwittingly endorse negative  
19 stereotypical beliefs (e.g. Burroughs *et al.*, 2006) and the older person is not empowered  
20 to challenge their negative attributions.  
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24 This information is important for professionals because interventions targeted  
25 to improved social support in persons with depression, functional and social limitations  
26 have been proved beneficial (Fong *et al.*, 2006; Harrison *et al.*, 2008). Until now models  
27 of negative attributions about ageing have been limited by the lack of appropriate tools.  
28 The AAQ allows for the above hypothesis to be further explored in clinical settings and  
29 with clinical populations (i.e., depressed) and special populations (i.e., caregivers).  
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#### 36 Limitations of the study.

37 First and most importantly, a convenience sample was recruited in this study and  
38 therefore it is difficult to say with any precision how representative these results are for  
39 the wider population. Nonetheless the same factor structure was achieved in comparison  
40 to that reported for the international sample. While all participants were community  
41 dwelling and free from cognitive impairment a large subset of the sample reported here  
42 were caregivers. There is no report of the AAQ being used with caregivers before,  
43 however as they were merely asked to complete the AAQ using the standard  
44 instructions, they approached this task free from any external consideration of being a  
45 caregiver and as such there ought to be no reliability issues. It would be interesting to  
46 follow this issue up further and examine the impact that caring for another person dying  
47 from a disease associated with old age has upon one's attitudes to ageing.  
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While questions are always raised about samples recruited opportunistically, basic sociodemographic characteristics such as gender and educational level did not differ from those reported on the Catalan health survey (ESCA - Enquesta de Salut de Catalunya, 2002). Second, we did not include participants living in care facilities. Third, we did not assess cognitive status of participants as no individuals with cognitive impairment would have met inclusion criteria hence the sample is free from impairment. Fourth, we did not collect information on the stability of the measure (test-retest). Fifth, the cross-sectional nature prevents a determination of causality.

In conclusion, it is expected that the AAQ will have high utility for professionals working with older people in distress. The AAQ can be useful as a direct measure of an individual's attitude to ageing. As studies have demonstrated that most older people endorse positive attitudes to ageing (Bryant *et al.*, 2012; Laidlaw *et al.*, 2007) the healthcare practitioner may wish to assess whether there is evidence for negative misattributions of the cause of their problems to ageing. Negative attitudes to ageing appear to be mood-state dependent (Bryant *et al.*, 2012; Chachamovich *et al.*, 2008) rather than a fixed unchangeable appraisal. This would suggest that practitioners may wish to assess mood-state at the same time as they assess attitudes.



**Conflict of interest:**

None. All authors declare that they have no conflict of interest.

**Description of authors' roles:**

Dr. Lucas-Carrasco had full access to the data and was responsible for carrying out the data analysis; she and Dr. Laidlaw interpreted the results and prepared the draft manuscript. Prof. Power and Prof. Gómez-Benito reviewed results and contributed to the drafting of the final manuscript by commenting on earlier versions.

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Table 1. Attitudes to Ageing scale.

**Psychosocial loss**

Old age is a time of loneliness  
Old age is a depressing time of life  
I find it more difficult to talk about my feelings as I get older  
I see old age mainly as a time of loss  
I am losing my physical independence as I get older  
As I get older I find it more difficult to make new friends  
I don't feel involved in society now that I am older  
I feel excluded from things because of my age

**Scale 2: Physical change**

It is important to take exercise at any age  
Growing older has been easier than I thought.  
I don't feel old  
My identity is not defined by my age  
I have more energy now than I expected for my age  
Problems with my physical health do not hold me back from doing what I want  
My health is better than I expected for my age  
I keep as fit and active as possible by exercising

**Scale 3: Psychological growth**

As people get older they are better able to cope with life  
It is a privilege to grow old  
Wisdom comes with age  
There are many pleasant things about growing older  
I am more accepting of myself as I have grown older  
It is very important to pass on the benefits of my experiences  
to younger people  
I believe my life has made a difference  
I want to give a good example to younger people

Source: Laidlaw *et al.*, 2007

Table 2. Participant characteristics

Sociodemographic and health status variables	Total sample n = 242
Age (years): mean (SD); Range	71.1 (7.1); 60-94
Gender: n (%)	
Male	96 (39.7)
Female	146 (60.3)
Marital Status: n (%)	
Married	159 (65.7)
Other	83 (34.3)
Educational Level: n (%)	
Primary & lower	132 (54.5)
Secondary & higher	108 (44.6)
Missing	2 (0.9)
N° chronic conditions: n (%)	
- <4	104 (43.0)
- ≥4	121 (50.0)
Missing	17 (7.0)
GDS-30	
mean (SD) Range	9.8 (6.1) (0-27)
GDS-30<11: n (%)	141 (58.3)
GDS-30≥11: n (%)	101 (41.7)
SF-12: mean (SD)	
Physical component (PCS12)	41.9 (10.8)
Mental component (MCS12)	50.5 (10.8)
SD: Standard Deviation; GDS-30: Geriatric Depression Scale 30-item version; SF-12: Short Form Health Survey	

Table 3. Descriptive statistics, acceptability and reliability parameters of the AAQ subscales

<i>Domain</i>	<i>Mean</i>	<i>SD</i>	<i>Missing (%)</i>	<i>Floor (%)</i>	<i>Ceiling (%)</i>	<i>Skewness</i>	<i>Kurtosis</i>	<i>α</i>
Physical change	26.7	4.9	.0	0.4	0.4	-.169	.334	.73
Psychological growth	27.7	4.3	3.7	1.7	0.4	-.031	.060	.59
Psychosocial loss	28.0	5.2	3.7	0.8	0.4	-.001	-.426	.70

SD: Standard Deviation;  $\alpha$ : Chronbach's alpha coefficient

Table 4. Rotated factor matrix of the Spanish AAQ

Item	Factor 1	Factor 2	Factor 3
	Physical	Psychosocial	Psychological
	Change	Loss	Growth
Old age time of illness	.084	<b>.420</b>	.085
Old age depressing time of life	.174	<b>.622</b>	.068
More difficult to talk about feelings	.031	<b>.451</b>	-.270
Old age mainly as a time of loss	-.289	<b>.492</b>	.267
Losing physical independence as I get older	-.261	<b>.571</b>	-.141
More difficult to make new friends	.105	<b>.630</b>	.068
Don't feel involved in society	.209	<b>.559</b>	.042
I feel excluded from things because of my age	.111	<b>.559</b>	-.137
Important to take exercise at any age	<b>.374</b>	.037	.169
Growing older easier than I thought	<b>.469</b>	.175	<b>.459</b>
I don't feel old	<b>.529</b>	-.081	.186
My identity is not defined by my age	<b>.529</b>	-.103	.078
More energy than I expected for my age	<b>.729</b>	.131	.086
Physical health problems don't hold me back	<b>.495</b>	.009	.124
Health is better than expected for my age	<b>.668</b>	.063	-.150
Keep myself as fit and active as possible by exercising	<b>.586</b>	.122	.121
Better able to cope with life	.113	.206	<b>.478</b>
Privilege to grow old	.092	.020	<b>.577</b>
Wisdom comes with age	.140	-.168	<b>.535</b>
Pleasant things about growing older	.132	.112	<b>.596</b>
More accepting of myself	.374	.044	<b>.425</b>
Pass on benefits of experience	-.054	-.078	<b>.553</b>
Believe my life has made a difference	.144	<b>-.424</b>	-.028
Want to give a good example	.242	-.237	<b>.387</b>

Table 5. **Convergent validity** Association of the AAQ with other measures using Pearson correlations.

	Physical		Psychological		Psychosocial	
	change	<i>p</i>	growth	<i>p</i>	loss	<i>p</i>
	<i>r</i>		<i>r</i>		<i>r</i>	
Age	-.137	.046	.063	.355	.122	.070
WHOQOL-BREF Domains						
Physical	.533	<.001	.120	.079	-.381	<.001
Psychological	.427	<.001	.104	.131	-.366	<.001
Social relation	.192	.005	.074	.276	-.264	<.001
Environment	.345	<.001	.077	.260	-.282	<.001
WHOQOL-OLD	.344	<.001	.114	.095	.359	<.001
SF-12						
Physical component (PCS12)	.403	<.001	-.080	.255	-.344	<.001
Mental component (MCS12)	.204	.004	.069	.325	-.378	<.001
GDS-30 total	-.347	<.001	-.101	.136	.448	<.001

GDS-30: Geriatric Depression Scale 30-item version; SF-12: Short Form Health Survey  
*r*=Pearson's correlation coefficient; *p*: *p* value



Table 6. Discriminant validity of the AAQ.

	Physical change		Psychological growth		Psychosocial loss	
	Mean (SD)	t test, df; p value	Mean (SD)	t test, df; p value	Mean (SD)	t test, df; p value
Sociodemographics						
Gender						
- Male	27.0 (4.5)	.875, 213; .383	27.9 (4.3)	.490, 217; .625	20.9 (5.6)	2.229, 219; .027
- Female	26.5 (5.2)		27.6 (4.4)		19.4 (4.9)	
Educational Level: n (%)						
- Primary & lower	26.1 (5.2)	-2.138, 211; .034	28.3 (4.5)	1.859, 215; .064	20.9 (5.2)	2.641, 217; .009
- Secondary & higher	27.5 (4.4)		27.2 (4.1)		19.0 (5.2)	
A priori defined groups						
Depressive symptoms						
- GDS-30 <11 non-depressed	28.0 (4.3)	4.732, 213; <.001	27.9 (4.0)	.690, 217; .491	18.5 (5.0)	-5.583, 219; <.001
- GDS-30 ≥11 depressed	24.9 (5.1)		27.5 (4.8)		22.2 (4.7)	
N° chronic conditions						
- <4	28.2 (4.5)	3.963, 201; <.001	27.5 (4.5)	-1.278, 203; .203	18.4 (5.1)	-4.025, 205; <.001
- ≥4	25.6 (5.0)		28.2 (4.3)		21.3 (5.1)	
Populations						
- primary care & community	27.2 (5.0)	2.468, 213; .014	28.2 (4.1)	2.608, 217; .010	20.0 (5.0)	.048, 219; .962
- Caregivers	25.4 (4.8)		26.6 (4.7)		20.0 (5.7)	

SD: Standard Deviation

GDS-30 =Geriatric Depression Scale-30 items